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National Digital Geospatial Data Framework

Applications of digital geospatial data vary greatly, but users have a recurring need for a few common themes of data. These themes include transportation, hydrography (rivers and lakes), geodetic control, digital imagery, government boundaries, elevation and bathymetry, and land ownership (or cadastral) information. A lack of investment, common standards, and coordination have created many situations in which these needs are not being met. As a result, important information is not available for many areas, and multiple organizations support duplicate data for other areas. A means to maintain and manage the common information being collected by the public and private sector does not exist. This results in increased costs and reduced efficiency for individual organizations, as well as for the Nation.

A *framework* to organize and enhance the activities of the geospatial data community to meet these needs is being developed. The concept was developed by representatives of county, regional, State, Federal, and other organizations under the auspices of the Federal Geographic Data Committee (FGDC).

The framework will provide a current base on which to collect, register, or integrate information accurately. To be successful, the framework data must be a dependable source of data, be of known quality, and be easy to access and use. Demands placed on data contributors must be minimized. The geographic features in the framework should include only the minimum information needed to classify, name, and uniquely identify a feature.

Both data contributors and users will enjoy benefits from the framework. These benefits include reduced expenditures for data, increased ease of obtaining and using data collected by others, accelerated development of mission-critical applications, increased number of customers for data products that are linked to the framework, and improved recognition of programs.

The framework has technical, operational, and institutional contexts. The technical context considers the needs to provide data at different resolutions and time periods, to ease the burden of using the framework, and to maintain the integrity of data contributed to the framework. The following technical aspects are proposed for the framework: a feature-based data model; permanent, unique feature identification codes; reference to modern horizontal and vertical geodetic datums; methods to integrate data for geographic areas that are adjacent or overlap; and the provision of metadata. The proposed operational context requires the ability to process changes to framework data using

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transactions, access past version of framework data, and locate framework data using

the National Geospatial Data Clearinghouse. Several of the proposed techniques in the technical and operational contexts are not well understood, and may be demanding to implement. To make certain that framework data are used widely, an institutional context is advocated that minimizes financial, organizational, and technical barriers to accessing and using the framework.

Innovative institutional arrangements ensure a robust and well-maintained framework. Ideally, the framework data for a geographic area will be developed, maintained, and integrated by organizations that produce and make use of data for that area. In addition, there is a need to ensure that the geographically-based units of framework data can be integrated to support applications for different or larger geographic areas. Organizations undertaking framework efforts have found that the following functions are critical to successful framework efforts:

- executive guidance — provide vision and direction for framework development.
- data development, maintenance, and integration — create, integrate, and update framework data.
- coordination — ensure that the contributions of organizations work together, and encourage productive relationships among participants.
- data management — ensure the continued viability of framework data through standards, data security, and disaster recovery.
- data access — enable users to obtain framework data.
- resource management — estimate income and expenses, obtain resources, and provide logistical support.
- monitor and response — measure users' satisfaction and provide market analysis.

These functions could be done by many different organizations. An organization may perform one or more functions. The functions an organization takes on may change over time. Organizations may take on different functions for different data themes.

The framework sets ambitious goals for the development of creative institutional arrangements and technical capabilities needed for the full implementation. A phased implementation strategy is proposed to allow these to be developed, tested, implemented, and improved.

Identifying potential participants is an important step in developing the framework. The National States Geographic Information Council (NSGIC) and the FGDC are developing an initial "snapshot" of data available from state, regional, and local governments throughout the United States. Other projects are helping organizations document their data using the FGDC metadata standard, and make these metadata available on the Internet through the National Geospatial Data Clearinghouse.

Many consortia are moving beyond inventory efforts to implement framework-like projects. They are experimenting with institutional arrangements, developing basic specifications and procedures, conducting pilot projects to test these arrangements and specifications, and investigating advanced capabilities required to implement the full suite of framework capabilities.

The framework is a means by which government agencies, the private sector, and others can work together to develop data needed for successful GIS implementation. This cooperation will yield benefits by increasing the availability of more current and accurate data, and by sharing costs with others.

The FGDC supports demonstration projects, hosts discussions of issues, and provides guidance for framework development. To provide comments about the framework, or to participate in framework development activities, please contact the FGDC, or visit the FGDC Web site at www.fgdc.gov.